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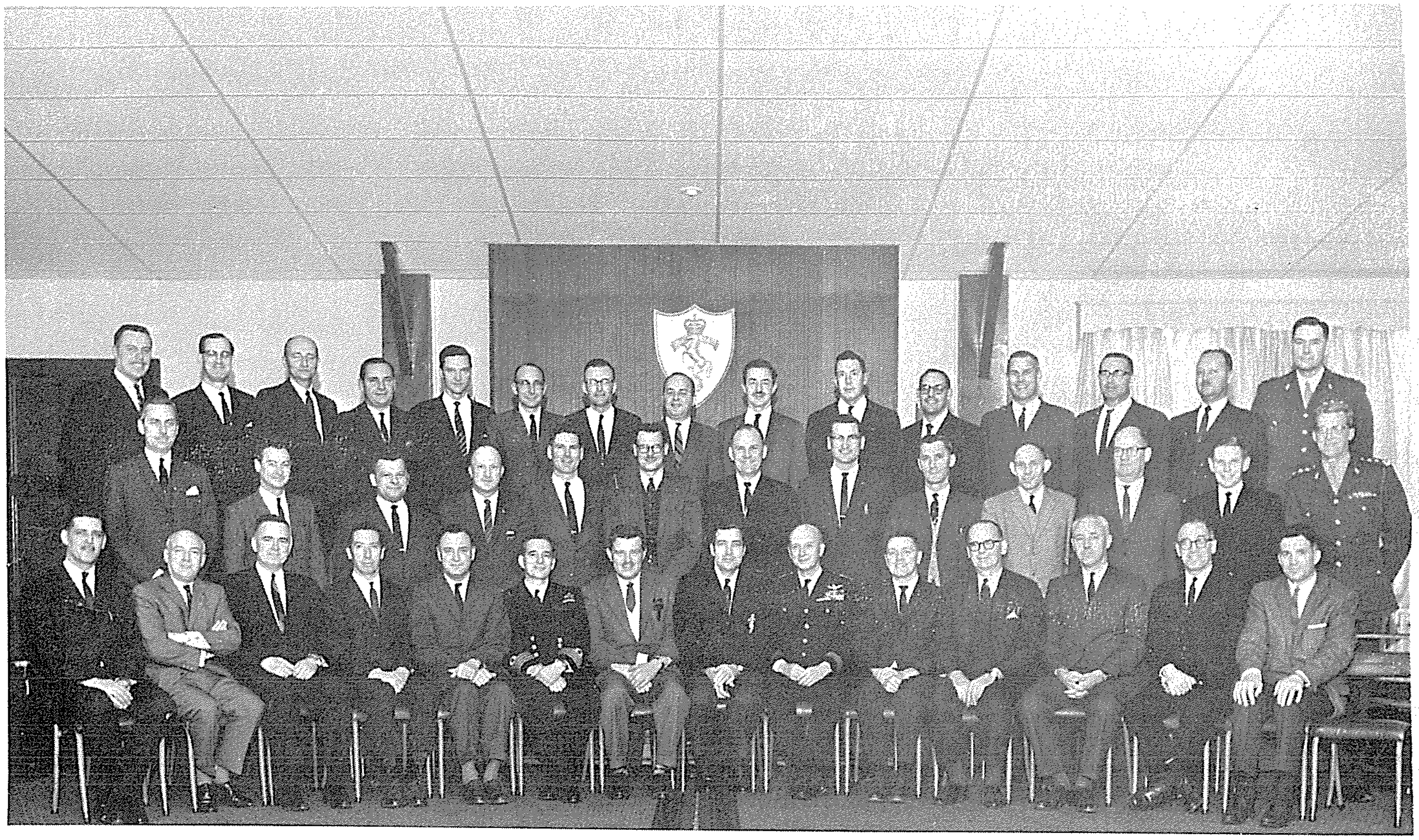

LAND MATERIEL MAINTENANCE

STUDY PERIOD

24-25-26 JANUARY 1968

RCEME TECHNICAL BULLETIN

THIS TECHNICAL BULLETIN IS PUBLISHED BY AUTHORITY OF COLONEL A.L. MACLEAN, CD, HEAD OF THE CORPS OF RCEME AND COMMANDANT, THE RCEME SCHOOL, WHO HAS APPROVED THE CONTENTS FOR PUBLICATION.

THE BULLETIN IS PUBLISHED TO ASSIST RCEME PERSONNEL IN KEEPING ABREAST OF CURRENT TRENDS IN DEVELOPMENTS AND TO CIRCULATE NEWS OF THE CORPS AND INDIVIDUAL ACTIVITIES AND TO PROVIDE A FORUM FOR DISCUSSION AND THE EXCHANGE OF IDEAS BY MEMBERS OF THE CORPS.

THE INFORMATION AND STATEMENTS HEREIN DO NOT NECESSARILY REPRESENT OFFICIAL POLICY AND ARE NOT TO BE QUOTED AS AUTHORITY FOR ACTION.

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RCEME TECHNICAL BULLETIN

VOLUME 13 NUMBER 1 March 1968

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EDITORIAL

by
Major P. Bateson

This edition introduces a new binding and a number of new features, both of which we hope will meet with your approbation. The former is designed to reduce printing costs and give the magazine a more professional appearance. The latter is an attempt to broaden the reader appeal.

Features are the mainstay of any magazine and we are grateful to the authors of those appearing in this edition. We would like to make the "personalities" page a permanent feature and for this purpose invite photographs and biographies of any members receiving awards or presentations or deserving of recognition for other reasons. Future editions can be expected to continue the Who's Where, even though the necessary information is getting harder to compile due to reorganization of the personnel branch. We are also extremely short of photographs for the back cover. For this, all we need is a good impact photograph of any subject. There are many amateur photographers in the Corps who could provide copy for this page.

Other features likely to appear in future editions are; "This is your life" - reports from RCEME Units and Personnel overseas and at home, workshop and maintenance production statistics and lastly we shall try to include news of retired personnel.

As you can see our plans are nothing if not ambitious. Despite the increase in features we will still require articles of all types to maintain the high standard set by previous issues. In this field our aim is to encourage junior ranks to try their hands at writing articles for publication. As a first step we have shortened the chain of communication and would ask any prospective authors to submit their articles direct to the Editor. There is no need to pass it through the normal command channels. As Editor, of course, I reserve the right to edit articles to ensure we do not contravene any regulations nor the accepted rules of good taste. Within these limitations we will try and publish every article we receive. So to you Corporals , Sergeants and Warrants lets have your ideas and complaints, who knows you may be a Milton in disguise.

Lastly your editor has begun an exchange of letters with Craftsman the magazine of REME. In return we expect to receive copy from that magazine. We may even be able to expand this to include other Commonwealth Armies. Where the subject matter warrants we also plan to ask Craftsman to republish articles from the Bulletin and in return we may reprint some of theirs.

All of these plans require some time to mature, but we hope they will provide you with a magazine of high interest and usefulness. We would welcome your criticisms and comments at any time you feel impelled to write.

LAND MATERIEL MAINTENANCE STUDY PERIOD

by

Lieutenant Colonel E.B. Creber

The topics were many and varied, but the interest never flagged during the LMM study period held at The RCEME School 24-26 January, 1968. As the cover photo shows, the study period was well attended, with 45 representatives coming from CFHQ, Training Command, Mobile Command, and Materiel Command, Officers from the sea and air environments not only added colour to the study period, but also brought the viewpoints of their varied backgrounds to the discussions.

The aims of the study period were:

a. To provide an opportunity to discuss recent developments affecting the land materiel maintenance organization and, by the exchange of ideas, to assist in increasing the effeciency of that organization.
b. To inform all concerned of recent activities and decisions which will affect the future of the land materiel maintenance organization.
c. To air problems that have arisen in the land materiel maintenance organization in recent months and to obtain the views of experienced officers on possible solutions.

After three days of lively discussions which frequently carried on through meals, break periods and much of the night, no one was left in any doubt that the aims had been completely realized.

By having a selected speaker introduce each topic, much material of interest was presented which stimulated questions and a free, far ranging discussion. The discussions did not result in formal resolutions or requests for policy changes, but many of those responsible for creating policy found new approaches to their problems.

The study period was opened by a welcome from the Commandant The RCEME School, Colonel A.L. Maclean, which he followed, as Head of Corps, with a report on the status of the RCEME Corps and its activities over the past year.

Some of the subjects presented and the introductory speakers were:

a.	Effects of New Rank/Trade Structure, Trade Specifications and Officers Training:	Lt Col E.B. Creber
b.	Base Development Planning:	Colonel A.H.R. Lewis
c.	Force Structure:	Colonel A.M. Reid
d.	Equipment Maintenance in the Field Force:	W/C F.C. Woodruff and Major F.W. Chapman
e.	Vehicle Management:	G/C J.A.G. Diack and Lt Col R.C. Rivers
f.	Training Command Philosophy, Plans and Progress:	Lt Col R.W. Libbey
g.	Developments in Maintenance Policy:	Capt (N) J.E. Roue and Lt Col M Ruscher
h.	Career Management of Technical Personnel:	Capt (N) R.W. Edwards and Major W.H. Norton, and Capt K.W. Henderson
j.	Weapons Systems Management:	G/C J.G. Mathieson and Lt Col D.G. Carlyle
k.	Activities of Director General Ordnance Systems	Colonel W.J. Owens
l.	On Job Training	Lt Col J.C. Boughton and Major K. Kennah

One highlight in the study period was provided by Major General J.G. Wilson Smith when he addressed the group on the subject of problems facing the Department of National Defence. His factual, well developed arguments, were delivered with telling effect upon the group, and did much to imbue confidence in the future of the Canadian Forces. He answered the many questions which followed in a very forthright and meaningful manner.

Towards the end of the study period, reports were given by the four Field Workshop Commanding Officers. Although each indicated, his problems were in part, peculiar to his own unit or location, all the reports clearly emphasized to everyone present that the real impact of all planning and policy is felt at the unit level.

The study period had its social side too, beginning with a social hour hosted by the RCEME Sgts' Mess on 24 January. This was followed on 25 January by a cocktail buffet evening hosted by the RCEME School Officers and their wives. The week's activities were climaxed by the Annual RCEME Corps Dining Out Mess Dinner during which the officers bade farewell to 15 officers retired from the Corps during 1967.

OFFICERS SHOWN ON COVER PAGE ARE LEFT TO RIGHT

Back Row:	Lt Col	A.N.P.	Roberts, CD	HQ Materiel Command
	Lt Col	C.G.	Racicot, CD	BTSO, CFB Montreal
	Lt Col	R.C.	Rivers, CD	HQ Materiel Command
	Lt Col	B.B.	Cox, CD	BTSO, CFB Calgary
	Lt Col	J.C.	Boughton, CD	CO, 3 Bde Svc Bn,
	Lt Col	S.A.	Girdler, CD	HQ Materiel Command
	Maj	C.A.	Millar, CD	CO, 1 Fd Wksp RCEME
	Lt Col	R.W.	Libbey, CD	HQ Training Command
	Lt Col	E.C.	Ilott, CD	CFHQ, DGOS, DARME
	Major	F.W.	Chapman, CD	HQ Mobile Command
	Major	J.G.R.	Doucet	CO, 4 Fd Wksp RCEME
	W/C	F.C.	Woodruff, CD	HQ Mobile Command
	S/L	B.H.	O'Hagan, CD	HQ Air Transport Command
	Lt Col	D.J.	Tidy, CD	CFHQ, DGSM, DPF
	Major	W.H.	Norton, CD	CFHQ, DPCSE
Middle: Row	Lt Col	E.G.	Jones, CD	CFHQ, DGM
	Lt Col	M.	Ruscher, CD	CFHQ, DGM
	Lt Col	B.	Yarymowich, CD	HQ Materiel Command
	W/C	W.J.	McIndoo, CD	BTSO, CFB Rivers
	Lt Col	E.B.	Creber, CD	The RCEME School
	Lt Col	R.F.	Fendick, CD	HQ Mobile Command
	Lt Col	D.G.	Carlyle, CD	HQ Materiel Command
	Lt Col	F.G.	Johnson, CD	27 COD, CFB London
	Lt Col	A.G.M.	Maitland CD	CASC, Kingston
	Lt Col	J.	Adams, CD	CFHQ, CO, LETE
	Lt Col	J.M.	Treleaven, CD	CFHQ, CG, D Man Eng
	Major	D.V.	Geary, CD	CO, 2 Fd Wksp RCEME
	Capt	K.W.	Henderson, CD	CFHQ, DPCSE
Front: Row	W/C	H.R.	Janes CD	BTSO, CFB Winnipeg
	Lt Col	G.W.	Bruce, CD	CO, 202 Wksp Depot RCEME
	Lt Col	C.G.	Provan, CD	HQ Materiel Command
	Col	A.M.	Reid, CD	HQ Mobile Command
	Col	W.J.	Owens, CD	CFHQ, DGOS, DFVE
	Capt (N)	R.W.	Edwards, CD	CFHQ, DPCSE
	Col	A.H.R.	Lewis,	CFHQ, DBD
	Col	A.L.	Maclean, CD	Comdt, The RCEME School
	Maj Gen	N.G.	Wilson Smith, DSO MBE, CD	CFHQ, DC Ops
	G/C	J.A.G.	Diack, CD	HQ Materiel Command
	Capt (N)	J.E.	Roue, CD	CFHQ, DGM
	Col	K.R.	Ward, CD	HQ Materiel Command
	Lt Col	W.H.	Glover, CD	BTSO, CFB Gagetown
	Major	K.T.	Kennah	CFB Gagetown

VALUE ANALYSIS

BY

Major R Stark and Major R Peters

This paper was prepared by the co-authors while attending No 27 Senior Management Course at The REME Officers' School, Arborfield, England during the winter of 1965-66.

Maj Stark commands the Vehicle Depot Workshop REME, Ashchurch, England. Maj Peters commands the Regimental Company of The RCEME School, Kingston, Ontario.

The paper was aimed at currect REME activities and therefore uses REME terminology and references. However, in these days of integration and unification, the contents apply equally well to RCEME.

INTRODUCTION

Value analysis can be defined as a series of techniques applied with the object of providing the best possible end product at the cheapest possible cost. These techniques are based on the application of expertise in respect of:

a. better utilization of labour and plant resources,

b. the employment of more efficient and faster production methods,

c. the elimination of excessive handling of materials and

d. the use of as few components as possible in the process.

In considering which, if any, of the techniques of value analysis could be applied within the REME the four basic concepts have to be kept constantly in mind. These concepts are the values of COST, ESTEEM or STATUS, EXCHANGE and USE. Military requirements in most product ranges, and with particular reference to general marketable products, differ from those of civilian needs insofar as no great emphasis need necessarily be placed on the ESTEEM or EXCHANGE values. This is so because the Army is neither particularly interested in the status symbol of possession, nor in the exchange value of the product when its service life has run out. The needs of both military and civilian users do, however, converge in respect of COST and USE values and considerable emphasis must, therefore, be placed on those two concepts of value analysis when considering the suitability of adaptability of marketable products for military use. The trends of COST and USE remain apparent throughout the entire life of equipment in Army service and play an important part in influencing the REME policy in respect of inspection and repair throughout its period of economic usefulness.

AIM

The aim of this paper is to consider to which activities in the REME value analysis could be applied with advantage.

ACTIVITIES TO WHICH VALUE ANALYSIS MIGHT BE APPLIED

Value analysis might be applied, in some form to the following activities within REME: Design; Repair Methods; Inspection Methods; Materials and Stores; Manufacture in Workshops; Plant and Machinery; Training.

DESIGN. Value analysis could be applied at the general arrangement state in the design of both purely military equipment and marketable range products used by the Army, and it is considered that REME, through the medium of either the MAGs or some appropriate organization, should be closely connected with the design activity of such products to advise on ease of maintenance, necessary repair techniques and reliability in service. Many civilian project engineers tend to concentrate on the ESTEEM and EXCHANGE values, and although they are also intimately concerned with COST it is considered that REME influence at this stage, where greater pressure could be brought to bear on the considerations of each of maintenance and repair during the life of the product, would be cost effectively beneficial.

REPAIR METHODS. A considerable amount of research and study has already been applied to this subject in the field of cost effectiveness, both from the point of view of economy of repair effort and minimizing cost of repair with increased repair efficiency through the Standard Estimating and Costing Procedure, and EMER A028 which outlines the economic repairs which should be undertaken in respect of Class III vehicles. Much still remains to be done in REME, however, in fields of repair activity other than vehicles and consideration should now be given to the formation of value analysis teams within REME - or within individual workshops - to look even more critically than in the past at methods and procedures of repair policy and practices.

INSPECTION METHODS. As in the case of repair methods many procedures and aids aimed at the reduction of cost and resources have already been involved and have succeeded in attaining a higher standard of inspection at lower operating cost. Wider use within the REME of such aids to inspection as dynavision type engine analysers, roller roads and tape recording techniques in respect of vehicle inspection, would, without doubt, improve the quality and standard of inspections and cut down the length of time taken to complete inspections thereby creating decreases in the number of examiners required.

MATERIALS AND STORES. Reductions in the use of materials and stores as a means of reducing cost and effort is considered a fair subject for the application of value analysis. A certain amount of progress has been made within REME in this field through the already implemented discontinuation of Class "B" modifications to Class III vehicles and also as the direct result of the introduction of SECP and EMER A028. It is considered, however, that there is still a long way to go before the ultimate savings and reductions are made and the application of value analysis techniques to the use of materials and stores in REME workshops could result in enormous reductions in the numbers of expensive materials and stores currently considered necessary and held in RAOC Stores sections attached to workshops.

MANUFACTURE IN WORKSHOPS. Value analysis, if applied to this activity in those cases where a large number of items, either for modifications where local manufacture has been authorized in EMERs or in the manufacture of NIV items, could result in saving a great deal of time and money and at the same time improve the standard of the article being manufactured. It is not envisaged that value analysis would be applied in cases of a very small number of "one only" manufacture.

PLANT AND MACHINERY. Many REME workshops retain items of plant and machinery long after the need for them has disappeared. Value analysis on plant and machinery holdings relative to the task of the workshop could therefore be applied in workshops to ascertain whether the existence of any particular item was necessary or to make an assessment as to whether its continued use was economically justified. Such analysis would undoubtedly throw up many items of plant and machinery, which, owing to a reduced dependency through age or the provision of more sophisticated machines have become unnecessary expenses. It might also reveal the need to consider reductions in operator labour.

TRAINING. As in the case of modern military equipment, technical training of necessity, has become sophisticated and in these times of tight budgets, careful attention must be paid to the methods of training to prevent any wastefulness. Value analysis applied to the complete sphere of technical training would provide a better answer to what technical personnel must, should or could know. Thus, the end product, be it officers or technicians, would be armed with the necessary knowledge to function efficiently and, at the same time, savings in effort, time, money and accommodation would be realized.

CONCLUSION: The application of value analysis techniques could be applied to the activities discussed in this paper, and it is represented that the resultant efficiency and economics would make consideration of the adoption of value analysis within REME as a standard procedure well worthwhile.

THE RCEME (CA(R))OFFICERS' FUND

A meeting of the Executive Committee of the Corps Fund was held at the RCEME School 26 Jan 68. A full report of the meeting has been sent to each member of the Executive Committee, but, because of the widespread interest in the Fund at this time, the following summary of decisions affecting the future of the Fund is published.

Agreement was reached on the following:

a. The Corps of RCEME as such will disappear sometime after 1 Feb 68, therefore the Fund must have a new connotation through a change in name and constitution so that the fund becomes the property of all those officers who were members as of 31 Jan 68 (This comprises the 288 officers listed at the back of this Bulletin). No new members may join after that date.
b. No subscriptions will be made to the Fund in 1968.
c. The Administrative Committee is charged with the task of developing plans for the disposal of assets to meet various possible contingencies.
d. While plans are being developed, and for as long as it is appropriate to do so, the F & E of the Fund will remain on loan to and in the Officers' Mess. (The Fund has purchased from the Officers' Mess, items acquired by the Mess over the years.)
e. The Administrative Committee must define and list the membership as of 31 Jan 68 (see sub-paragraph a. above) and define the Executive Committee so that continuity of management is provided regardless of changes in Canadian Armed Forces organizations.
f. The first task of the Administrative Committee is to formulate a plan for the Fund F & E in the event that the Officers' Mess is closed.

A VISIT TO A FIELD WORKSHOP

OR

THIS IS THE LIFE

by

Lieutenants

BE Kelly; RP Kudar and JJ Dorepos

It was hard to believe. For two weeks the Subaltern EME course had been studying and discussing the operations of a field workshop. The instructors had the audacity to tell us one of these places actually existed and we were going to see one. Up to this point we had all considered a field workshop as a figment of someone's imagination to be used for RCEME Field Operations exercises.

On 2 Oct 67, we left for Petawawa to see 2 Field Workshop in its natural habitat. Arriving at Petawawa we carefully inspected all messes before finally deciding on eating lunch at the only mess that would have us.

After lunch, we embussed and headed out to the hinterland. First stop was the location where the Forward Repair Platoon had to repair the brakes of a truck belonging to the aircraft platoon. Here we got a vivid taste of RCEME practicality. Why work outdoors when there is a large hanger available? Besides, the RCEME personnel would appreciate the heat more than the airplanes would.

Confident that all was in control at the hanger, we continued on over hill, dale and airfield to the highway. We had been taught that RCEME really knows how to disappear in the woods. Only the keenest of perception and the seventy cars in the visitor park enabled us to detect the workshop location.

We were greeted at the entrance of the workshop by Major Geary, The Workshop Commander. After a short welcoming speech, we were divided into syndicates and conducted through the workshop sections, spending a short period in each to see the equipment and layout. It became abundantly clear to us why our instructors had turned blue with frustration when we suggested placing 2½ ton trucks in a stand of saplings.

Once the scope of a field workshop had been consolidated in our minds, we were taken further ahead and shown an FRP site. Again RCEME's proficiency and practicality was demonstrated by the short period of time required to decamouflage an M62 wrecker and get it on the road.

One of the sharpest lessons pointed out to us was the size of the area required for messing facilities. Each of us, to this point, had not really appreciated the room that was required. In addition to the size of area required, we were also instructed on some of the fundamental necessities for field messing. The most noticable of these necessities was a canteen truck. This lesson was investigated and taken to heart.

The second day was used to point out that there is more involved in a field workshop than merely occupying the ground. We discovered that getting there was four-fifths of the battle. Working from a simulated warning order from Brigade Headquarters the workshop begain to prepare to move to a new site.

Each syndicate was assigned to a particular section of the workshop, to take part in: the preparations to move, the move itself, and the setting up after the move was completed.

Lessons are learned from mistakes, so Major Geary ensured that we would learn our lessons by changing the route part way through the exercise. Most of us had never driven a large convoy but we had sufficient knowledge to know that something was amiss when two packets were on the same road heading in opposite directions. We further deduced that it was not SOP for two packets to come to the same intersection on different roads. However, we did learn that tight control must be maintained or chaos will result. The packets whose route had not been changed had no problem arriving at the new site.

Once the vehicles in each section had been deployed, defensive responsibilities were assigned to the Subaltern EME Course and a defense of the workshop was prepared.

The final day of the tour was highlighted by a visit from Major F.G. Hutson, the DAA and QMG of the brigade. We spent an enjoyable dinner hour learning about some of the complexities of his position.

What was the sum total of the tour? Needles to say, it was a success. We now know what a field workshop is and what its capabilities are. We gained a feeling for the layout of various sections. We have a better idea of messing facilities required and we learned that moving a workshop consists of more than merely driving down the highway as on a picnic.

HOW TO SPEND MONEY WITHOUT TEARS

By Major P. Bateson

When I went home that night and told my wife that I'd been given another job she evinced the usual matrimonial interest.

"Yes", I said, "I'm now President of the Men's Canteen. But get a load of this, the boss wants me to start spending the $5,000 the canteen has accumulated."

"Well", she replied. "If he wants money spent he's certainly picked the right guy. You spend your own like it was going out of style. Someone elses' will be like water in a sieve to you."

With that challenge in mind I called a meeting of the newly formed committee and asked for their ideas on redecorating the canteen. To say they were exuberant was to put it mildly. But despite my wife's predictions I determined to use the money wisely and so I requested the committee members to give some thought to a theme to give our efforts direction.

At the next meeting we discussed a sampling of themes, most of which I culled from tourist literature from Florida and the West Indies (obtained in preparation for my retirement). We soon discarded such exotic appellation as the Caribbean and the Aztec and moved on to more appropriate themes. The Cataraqui Room or the Frontenac were locally appropriate and the Horse and Globe seemed a good prospect. Finally Cfn Monaghan suggested we go for either a Western or an old English pub theme. Put to the vote the latter won hands down or up. This was very fortunate because I consider myself something of an expert on English pubs. Later I found this more than fortunate as some people have some positively wierd ideas of what a pub is like.

From the theme we proceeded to a name. Cfn Kidd proposed the "Coach and Horses" which seemed satisfactory to everyone, so that too was soon settled.

Meantime some immediate improvements were obviously necessary, the prime one being a new stage. The existing stage had outlived its usefullness so we quickly had a new one built in time for the St Patrick's dance. The back drop and sides which were to be drapes couldn't be finished in time, so a temporary curtain was hung for that dance.

Other areas requiring improvements were the panelling of the mixed lounge which for some reason that will never be revealed was installed upside down, slip covers which were the original purchase ten years ago and by now worn out, rugs which were non-existent and bar furniture which was standard issue. The bar itself which is shared with the Corporals needed enlarging and redecorating and lastly the hallway which was festooned with orders and instructions designed to frighten away any prospective patrons.

To get the ladies point of view Mrs Kidd was asked for her ideas. Other ideas were obtained from Cpl Koshowski and SSgt Saunders. Finally an interior decorator was called to co-ordinate the whole design. Books on pubs and on interior decorating were obtained from the public library and soon we were using words such as dado, wainscotting, Adam pattern, etc.

The hunt for furniture started down town. The first store tried to sell me home dining room furniture, which as I pointed out, would hardly stand up to bar service for 400 soldiers. The second store thought that picnic tables would be ideal and that they would fit in with the English pub decor. As I told the salesman, picnic tables looked like picnic tables and were generally found on the side of the road and not in pubs. Goodfellow's at Westport showed us exactly what we wanted; thirty inches square, oak finish, center post and at a good price.

Then the decorator came up with sample material for slip covers, ozite rugs and drapes. A few trips under the leadership of SSgt Saunders produced an old fireplace frame and Cpl Koshowski designed a suitable pub sign. We were now ready to present the plan to the Commandant and get approval of the expenditures.

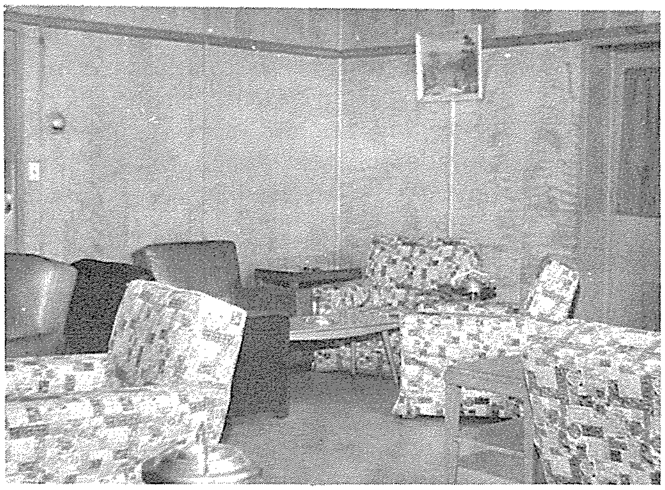
The presentation was done, complete with samples of wall papers, cloth, drapes, and a sketch of the sign. The total cost of the whole project would $7,700. This of course, was more than could be spent immediately so in true Staff College style the project was divided into two phases both under $5,000. It just so happens that the Base Commander can authorize an expenditure not exceeding $5,000.

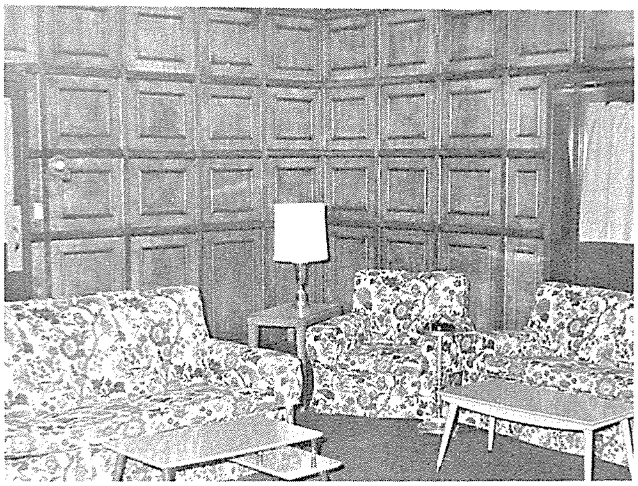
Work began in earnest with the aim of completing it before the Corps Birthday. This was achieved except for the wall papering. The latter had to wait until August. Finally after much hard work by many people the job was completed and the new COACH AND HORSES was officially opened in September 67, by the Commandant of The RCEME School.

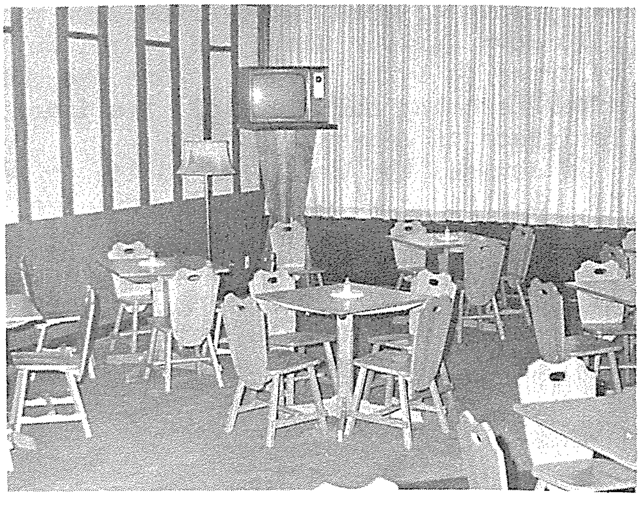
The accompanying photographs show two views before and after of the bar and the mixed lounge.

BEFORE

AFTER







RCEME School Camera Club

ON LYING IN BED

by Sergeant Roy J. Pottery

Lying in bed, I assure you, can be one of the most pleasant of habits imaginable. Though regarded as one of the greatest of the universal foibles of mankind, this noble art is indeed a blessing in disguise. Perhaps that which appeals to the individual more than anything else is the fact that this sport may be easily undertaken although it is not listed in the CFAOs as one of the official sports. This wonderful institution boosts members ranging from the highest peers in royalty to the ignoble "suck hound" and day by day the nominal roll is growing. Have you been to the barrack block latety? Whether you are a sovereign and have twelve lords of the bedchamber wait upon you, or be just the common everyday man with a wife, you can and will enjoy lying in bed.

Before going on, let us examine the article that is essential to the success of the art. Obviously, I am referring to that great object that is commonly known as the bed. There are a multitude of changes for this peer of domestic furniture upon which one sleeps or rests, and a wealth of types are now in existence, but each serves in one way or another to bring about that joy of joys - lying in bed. The Anglo-Saxons had wooden beds built into recesses, the bedding made of straw. Inevitabley the "four poster," remained the model for centuries, and many handsome specimens of carved and heavily draped beds of this kind are still preserved. Perhaps one of the most famous of all is the Great Bed of Ware, which is capable of accommodating a dozen people. This oak masterpiece dating back to 1463, is said to have belonged to Warwick the King Maker. However, in the last century the metal frame bed has come into its own, being no doubt, somewhat of an improvement over older styles, having better stability, freer design and introducing inovations that tend to make lying in bed more to be enjoyed. Among many other designs, we have the book shelf bed where one packs pocket books by the dozens and heaven help the little lady if she proceeds to re-arrange any of the intellectual literature. We have on the market an aerodynamic bed which, claimed the innovator, was designed and built to give more lift in proportion to less weight. (Please take note all airmen).

Beds, I might add are of ancient origin and came in with civilization, and undoubtedly will conversely go out with civilization. Imagine Adam lying comfortably on his home-made bed of beds, and regarding with contemplative eye a luscious red apple hanging tantalizing on a tree in the Garden of Eden. History says that beds were well known in Egypt, Greece and Rome. In all probability, the great Caesar himself upon waking on a bright sunny morning lay happily in bed, and calling for his steno, dictated terms the ultimatum to the members of the third estate. I am convinced that this art has been a public institution for ages and if we could be TRANSPLANTED to the days of the hardy cave-man, one would undoubtedly see, chiselled skillfully on the daily slab of work, an overwhelming percentage in favour of the gentle reclination.

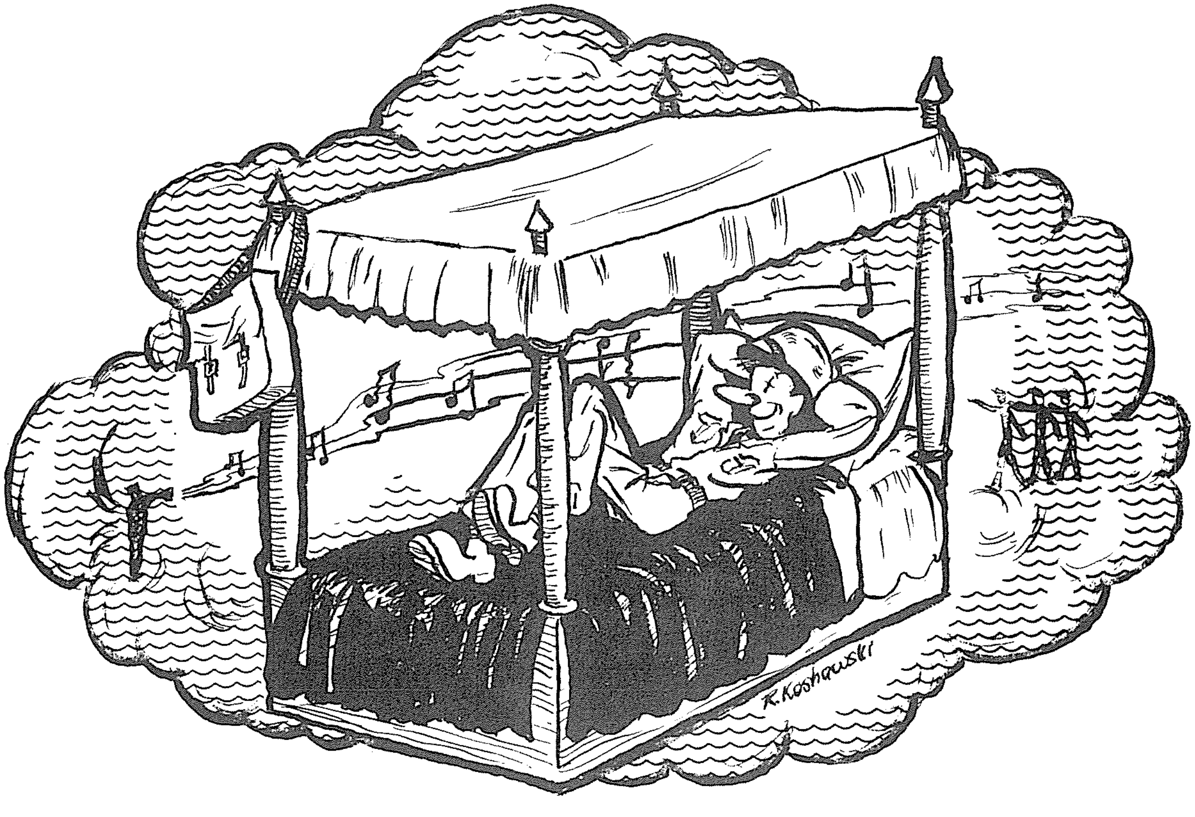
To move further along the years, we find that the immortal Wordsworth was a great believer in lying in bed. One can obtain much enjoyment from relaxing in bed, and after becoming oblivious of the immediate surroundings, relive past experiences and reminisce in general.

Of course, the best time to lie in bed is the morning, immediately after awakening, for at this point the mind is freshest and to back the reminiscing theory the memory is sharpest. This morning dreaming, if one wishes to call it by such a highly irregular nomenclature, will and can, with a bit of assistance from the inner nature, become one of the most fascinating of adventures. As I have already stated it may be a blessing in disguise, so with such a pre-arrangement of thought, one is bound to start the new day on the right foot. Consider the man who has indulged the night before.

He finds himself in a sorry plight, he cannot enjoy the royal qualities of the magnificent art. The asperation of this poor soul in hoping that his day at the office will be successful, are shattered because he unthinkingly arose too soon. Forthwith, the unhappy individual may be seen swallowing sedatives, gulping down aspirins and involving evil upon everything and everyone in general. Perhaps the person's lamentations don't go to such extremes, but think of the trouble and nerves that might have been saved if the afflicted person had spent five or ten minutes debating on the advantages and disadvantages of arising under such conditions. The few extra minutes in bed could and most probably would change the course of a whole day's work.

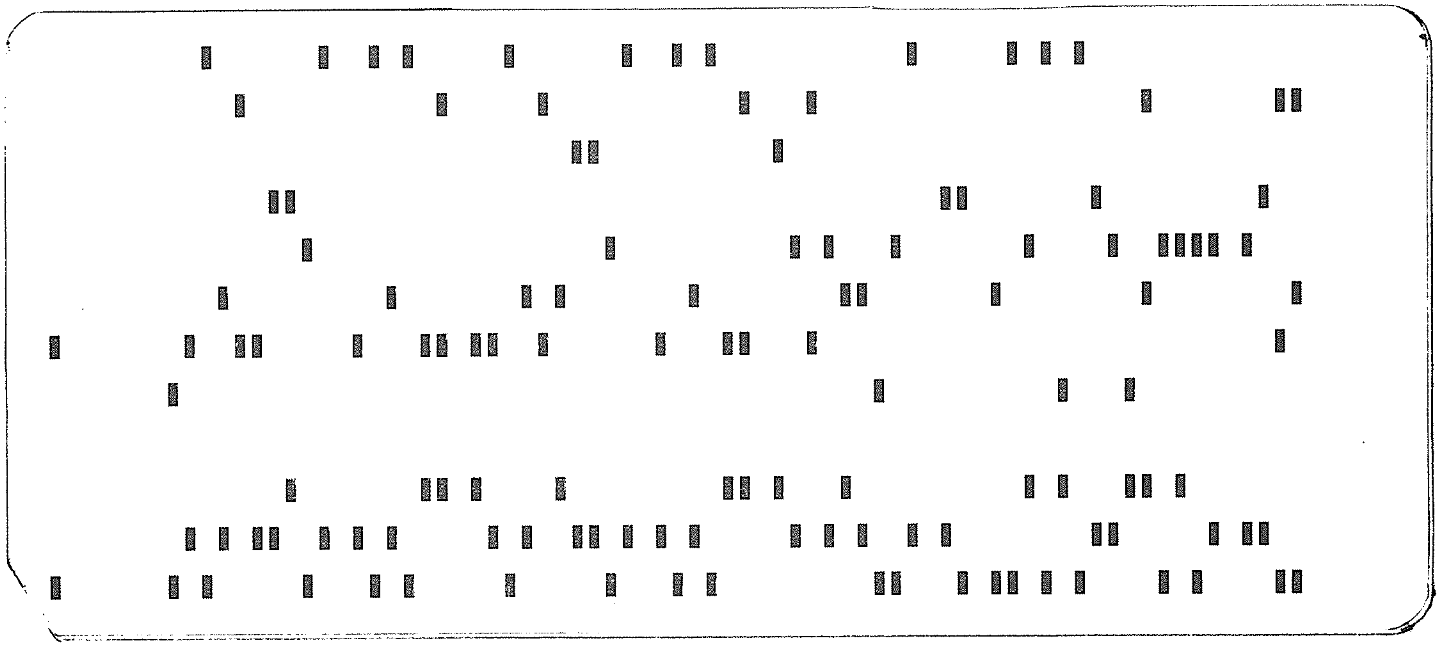
I read once that adventure is only an inconvenience rightly considered, while an inconvenience is only an adventure wrongly considered. How evil a statement. When I think of the thousands of people who daily miss one of the greatest adventures of all just because they consider it an inconvenience. I relapse into a state of nervous apprehension and (like the poor unfortunate above) have to revitalize by the ever-present bottle of aspirin. I cannot find adequate words to express my sympathy for them. Of course, I have no use for trespassers that perjure the unwritten laws of the venerable order by unnecessarily lying abed too long. These delinquent men deserve no sympathy, and their dismay upon finding that half a day has been wasted is,in my opinion, just punishment for their lazy and non-laborious efforts. It is one thing to remain in bed with a definite object in view, it is another thing to be in bed with such a state of laziness that the perjurer cannot even muster enough energy to swat the fly that has settled upon his ear.

In spite of the foregoing, I will still maintain that lying in bed is indeed a blessing in disguise.



THE COMPUTER HOLE PROBLEM

Evidence of Scientific sophistication in the worlds of business and engineering is being offered by staggering numbers of small, perforated oblong pieces of light cardboard which engulf our society. The things which beseech us continually to refrain from bending, stapling or tearing, Yes, the punch card.



Look at it. Within it, and its countless relatives, may well lie the future progress of our civilization. Ask an elementary question. Wherein does its value lie is it in the card or in the holes?

Information is not stored in the cards, but locked in the holes. This leads to an obvious question, which the machine people have overlooked. The holes represent an area up to 10% of the card which is physically removed and thrown away. Then why keep the remaining 90% of the card which is of no value?

Some people, would argue that the card holds the holes together. Others insist it holds the holes apart. But the holes in the punch cards are empty, therefore, they contain nothing. The question of whether two nothings are being held together or apart is purely philosophical, and we are left with the intriguing prospect of working solely with the holes.

The advantages are obvious. Tossing the left over aside would: produce immediate savings in elastic bands; eliminate worry over mildew in storage; reduce shiping costs and storage space; provide complete flexibility of operation; facilitate correction of errors; eliminate filing problems, since nobody has invented a method for filing holes.

The advanced theory is that nothing is something, and something is nothing. This is not easily understood except by those who understand NOTHING.

NEW PROMOTION SYSTEM FOR MEN

CFAO 29-4 outlines the new method of selecting men for promotion. At present not all the provisions of this CFAO can be implemented due to disparities in reporting on performance of men in the navy, army and air force. The Director General Postings and Careers has, therefore, circulated a letter (P 5642-9 (DPI/DPM) of, 21 Dec 67), to explain how the system will apply in 1968.

Briefly all selections for promotion to Sgt, SSgt, WO 2 and WO 1 in the army and air force will be made by promotion boards convening early in 1968. Promotion will be based on merit and the following criteria will apply:

a. Candidates will be considered in groupings of like trades in the CA (R) and RCAF.

b. Candidates will be in competition only with tradesmen from their own service, in their paid trade.

c. Both land and air environments will be represented on the boards, with the exception that single environment combat trades will be considered by a Board composed only of members from that environment.

d. Common procedures will be used for all boards irrespective of rank, trade, or service of candidates.

e. Groupings of trades will be considered by a board composed of five officers for promotion to the ranks of WO 2 and WO 1 and by four officers and one WO 1 for promotion to Sgt and SSgt.

f. For the 1968 promotion boards a total of 14 individual boards will be covened to review the files of approximately 28,000 servicemen.

The 1968 promotion boards will produce single service listing recommending promotion. The use of combined CA (R) and RCAF boards is one more step in the achievement of common promotion practices. Inclusion of navy personnel will follow as soon as the necessary files and performance evaluation reports are compiled.

Additional information including the detailed method of marking used by promotion boards is contained in the DGPC letter referred to in the first paragraph.

NEW DEAL FOR FORCES ENGINEERS PROPOSED

(Reprinted from Engineering Digest December 67)

A searching analysis of the status of engineers in the Armed Forces is now in the hands of the Chief of Technical Services, as the result of the work of a special committee of Canadian Council of Professional Engineers.

After a thorough study of documents provided by Defence Headquarters and C.C.P.E. , the committee met in a series of three full day meetings to complete the basic work which has resulted in its report. Among other things, the committee concluded that:

(1) Unusual salary administration and, in many cases, lack of job challenge appear to be the two most important factors which presently act against the retention of young engineers in the armed forces;
(2) The young engineering graduate is technically oriented and wished to practice his profession during the first few years of his career. He also has been told that a good deal of his recently acquired knowledge will become obsolete within a few years;
(3) The present salary progression system under which a young officer does not get an increase until he has completed two years of service, contributes undoubtedly to low moral;
(4) It appears doubtful that the armed forces really need all the engineers presently being recruited.

The following broad recommendations were submitted for the consideration of the Chief of Technical Services and Chief of Personnel:

(1) Enrolment Methods. Recruiting must be carried out with realism in describing career development, opportunities, progression, salary range, etc.....to reduce the possibility of misunderstanding and subsequent frustrations. In particular, if there is to be an emphasis on a military rather than an engineering career, this should be clearly stated. R.M.C. and R.O.T.P. plans should be thoroughly assessed to establish cost vs results achieved, and comparisons made with other possible recruiting methods, such as being fully competative on the open market. The numerical requirement for engineering graduates in the Armed Forces must be realistically established.

(2) Initial Employment. A thorough study should be undertaken to determine the possibility of changing the present system of initial employment to enable the young engineer to make better use of his recently acquired technical knowledge and training during the first few years of his career.

(3) Career Opportunities & Post-Graduate or Post-Enlistment Education. The philosophy underlying the present career development system must be reviewed to accommodate to a greater extent than at present, the aspirations of young engineers for a more normal engineering career development while still being responsive to overall military requirements. Individual engineers in the armed forces should have a stronger voice in planning their own career development. It is generally found that this tends to encourage people to stay with an organization.

(4) Utilization. A utilization study should be carried out at an early date to determine the real numerical requirement for engineering graduates in the armed forces. Simultaneously a study should be carried out to develop a better understanding of the applicability of the engineering technologist to the Armed Forces. Subsequently the feasibility of using engineering technologists for many of the functions now being performed by engineers should be studied along with recruit-methods, training standards, and career development. Serious consideration should be given to the possibility of utilizing an engineer's technical ability at the time he is most interested in making use of it, that is, early in his career, for most individuals.

(5) Renumeration. It is imperative that starting salaries and salary progression of engineer officers be in line with going rates in industry in all cases where such officers are employed in their professional capacity. The salary progression system should be reviewed so that a young engineer officer could get salary increases every six months or so during his first two years and annually after that. This is common practice in civilian employment. It is also imperative that fringe benefits and other personnel policies be brought in line with current practices in industry. Serious consideration should be given to the possibility of paying engineer officers on a merit and/or professional responsibility basis, without penalizing their opportunities for regular military development.

(6) General. It is considered that the career, opportunities and professional development of individual engineers in the Armed Forces should be of particular concern to specific senior military officers of the same of a closely related specialization. This is of particular importance in the case of young engineers who should be clearly aware of the personal interest of a distinguished engineering officer in their professional and personal development.

The Committee was composed of:
Chairman: G.M. McHenry, P. Eng., Vice-President, A.P.E.O., Manager, Western Region, Hydro Electric Power Commission of Ontario.

Representing the Chief of Technical Services:
Commodore S. Mathwin Davis, M. Eng., Director General, Systems Management, Canadian Forces Headquarters.

Representing the Council:
Donald L. King, P. Eng., Principal, Stevenson & Kellogg Ltd.,
Guy Saint Pierre, Eng., Registrar, Corporation of Engineers of Quebec.

W.H.C. Baldwin, Eng., General Supervisor, Personnel Department, Bell Telephone Co. of Canada. L.M. Nadeau, P. Eng., General Manager, Canadian Council of Professional Engineers.

Plastic foam fills fuel tanks to suppress explosion hazard

Reprinted from the November 20, 1967 issue of PRODUCT ENGINEERING
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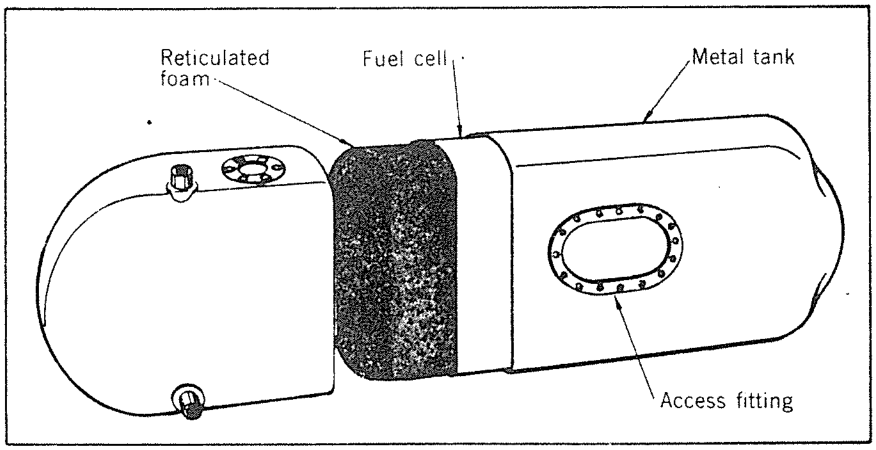

Foam-filled safety fuel tank for racing cars forestalls explosions by preventing spread of flames and heat. Foam occupies only 3% of the tank's volume.

An open-cell urethane foam, 97% void, is helping eliminate fuel tank explosions on military aircraft. The material is molded and machined to fill the tanks.

Called reticulated foam (trade-named Safom), the plastic works by breaking up the compression wave that precedes a flame front, slowing it so the velocity necessary for explosion is never reached. The foam also acts as a heat sink to dissipate some of the heat of ignition. A third function of the foam is to prevent the air and fuel from mixing in lean ratios necessary for combustion.

The reticulated structure has high weight-bearing and stress-distributing properties. Flexible fuel tanks can withstand high impact without bursting. Tanks in racing cars have survived spectacular crashes with little damage.

Ready for new markets. The foam has been under test for several years by the Air Force and Firestone Tire & Rubber Co., Inc. Now the material is being readied for entry into such commercial fields as trucks, boats, tankers, commercial airplanes mines and storage tanks.

On commercial aircraft, the foam system can minimize fire and explosion in wing and fuselage tanks as well as in fuel vent lines and collector boxes. The Federal Aviation Agency is conducting a year long study of these applications.

The added safety factor of the foam may change design and location of fuel tanks on passenger vehicles. With the fire hazard virtually eliminated, foam-filled tanks could be placed anywhere--under doors or fenders, for example.

Fire hazards aboard ships could also be reduced by adding foam to fuel tanks and vent lines, in holds and bilges, and even in spaces where combustible cargo is stored.

Origins. Firestone designs and builds the foam-filled tanks for the Air Force and also conducts its own race-car-tank test program.

The open-cell foam was developed by Scott Paper Co. and resembles the reticulated foams sold by that company for filters and cushioning. But Safom is cleaner, containing almost no residual particles that might contaminate fuel. Moreover, a special process controls pore size closely, holding to 10 pores per linear in.

The foam weighs approximately 1.8 lb. per cu. ft. and is completely free of the usual membranes that characterize "sponge" forms of urethane foam. Reticulated foam is actually a three-dimensional skeletal structure with interconnecting strands of urethane elastomer.

So far, the foam cannot be foamed in place like other foams, because of the necessity for tight control. But Scott is working on modified versions that might eliminate the method now employed--careful cutting with a hot wire to complex shapes.

Because of the tight controls, hand working of shapes, and limited volume production, the present price of installation in fuel tanks is fairly high--about $1/lb. Firestone believes more experience with the process and an increase in production volume may bring the price down in the near future.

Simple test shows unrestricted flow of liquids through membrane-free foam.

Why Not Use Mig Welding For Maintenance Work?

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from the October 1967
PLANT ENGINEERING
MAGAZINE

MIG IS A METAL ARC, gas shielded process, which has many advantages, such as portability, and adaptability to present equipment.

Mig (short for metal inert gas) welding has been considered primarily a production tool, because it lends itself so well to automatic operation. A manual Mig torch in the hands of an experienced maintenance weldor, however, gives him a tool which allows him to do many welding jobs which would be difficult, if not impossible, using conventional methods.

Operating principles—Mig welding is an electric arc welding process in which a solid or fabricated consumable wire electrode is continuously fed into the weld pool while shielded by a protective gas. The Mig process was initially used with argon and helium. Later an argon-plus-oxygen mixture was developed which improves arc stabilization and weld quality. Carbon dioxide is being used for certain applications, and offers economy along with several other advantages.

There are five principal components in the Mig welding process: the welding gun, a controlled wire drive unit, the electrode wire, a shielding gas, and the welding power source. (See illustration). Both hand-held and remote wire drive units are commercially available. Since wire may be from 100 to over 400 in. per minute, manual feed of the wire is not practical.

The wire drive unit feeds the electrode wire into the weld pool at a constant but adjustable rate. This may be accomplished either mechanically, electromechanically, or electronically. Interconnected circuits normally control initiation and interruption of electrode wire feed, shielding gas, cooling water, and welding current.

Shielding gases—Selection of shielding gas for Mig welding depends on the requirements of the job. Argon or carbon dioxide gas tend to produce a deep penetration weld pattern, while helium tends to flatten the weld. Argon alone is not satisfactory as a shielding gas for carbon steels. A small percentage of oxygen improves arc stabilization and metal deposition. Pre-mixed argon plus oxygen in varying percentages can be purchased for special welding requirements.

Table I shows effect of shielding gas on weld analysis of 347 stainless steel. Oxygen in these gas mixtures tends to oxidize the manganese, silicon, and other alloys in steel. For Mig welding applications with non-ferrous metals, the oxygen mixtures are too reactive. Straight argon or argon-helium mixtures are used almost exclusively. Helium is seldom used alone because of its light density, which requires greater volumes of gas, and its relatively high cost. Tables II and III show recommended gases for various non-ferrous metals.

Carbon dioxide is often used as a shielding gas for Mig welding carbon steel. Unlike argon and helium, CO_2 is chemically active. In the intense heat of the arc, carbon dioxide disassociates into carbon monoxide and oxygen. The resulting free oxygen burns out or oxidizes the manganese, silicon and carbon from the weld area.

To offset the oxidizing effect of CO_2, new solid wire electrodes have been introduced with higher percentages of manganese and silicon. Fabricated wire electrodes have been developed especially for welding carbon steel shielded with carbon dioxide. The core of these wires contains fine granular gas producing flux particles and metallic elements to deoxidize and alloy with the weld deposit.

Metal transfer tends to be more globular with CO_2 shield. Higher current is required to approach a spray-like transfer and prevent excessive short-circuiting of the arc. As a direct result, greater penetration and higher weld speeds are obtained—but at the expense of having some weld spatter.

Electrodes—Mig wire electrodes are available from 0.030 in. to 0.156 in. A rule of thumb states that the minimum metal thickness which can be welded by the Mig process is approximately equal to the wire diameter. The maximum weld thickness is limited by the current carrying capabilities of the electrode. Table IV gives recommended data.

Table I. Metallurgical analyses of 347 stainless steel weldments using 347 electrode wire with various shielding gases.

Chemical Composition of Welds in Stainless Steel

	Analyses, %					
Sample	*C*	*Mn*	*Si*	*Cr*	*Ni*	*Cb*
347 Plate	0.044	1.50	0.54	18.14	10.07	0.50
347 Wire	0.044	1.56	0.42	18.19	9.07	0.67
Weld—argon	0.048	1.42	0.46	17.79	9.55	0.64
Weld—2½% O_2	0.040	1.41	0.48	17.86	9.43	0.63
Weld—5% O_2	0.042	1.36	0.43	17.89	9.38	0.62

Table II. Recommended shielding gases for Mig-welding various thicknesses of aluminum plate, with aluminum wire electrode.

Shielding Gas Preference—Aluminum

Plate thickness (in.)	*Gas mixture*
0-1	Argon
1-2	Argon 50% argon—50% helium
2-3	50% argon—50% helium 25% argon—75% helium
3+	25% argon—75% helium

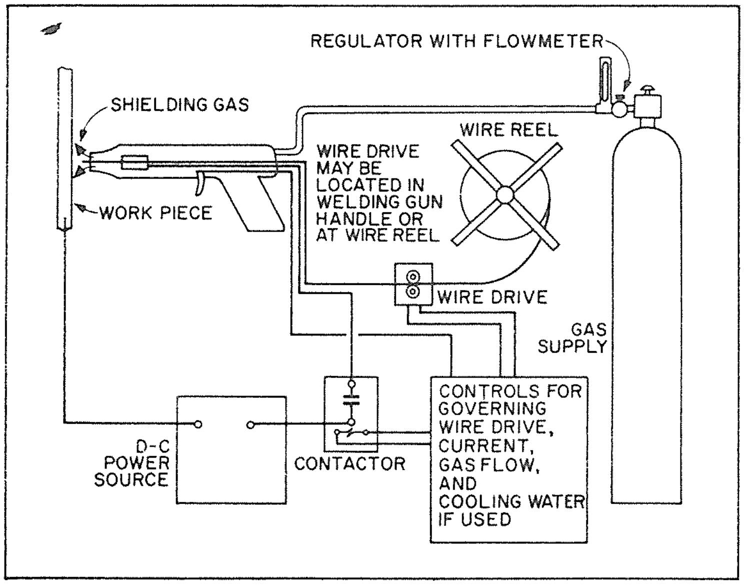

REGULATOR WITH FLOWMETER
SHIELDING GAS
WIRE REEL
WIRE DRIVE MAY BE LOCATED IN WELDING GUN HANDLE OR AT WIRE REEL
WORK PIECE
WIRE DRIVE
GAS SUPPLY
CONTROLS FOR GOVERNING WIRE DRIVE, CURRENT, GAS FLOW, AND COOLING WATER IF USED
D-C POWER SOURCE
CONTACTOR

Diagram illustrates the five major components of a Mig welding system: the welding gun, controlled wire drive unit, electrode wire, shielding gas, and the welding power source.

Table III. Preferences of different gases when using Mig for butt welds and double vee welds in nickel and nickel alloys.

Recommended Shielding Gases for Welding Nickel Alloys

	⅛ in. butt		*¼ in. double vee*	
Material	*Preference*	*Gas mixture*	*Preference*	*Gas mixture*
Nickel		75% helium	1	50% helium
	1	25% argon	1	50% argon
		50% helium	1	75% helium
	2	50% argon	1	25% argon
	3	Argon	2	Argon
Monel and Inconel		50% helium		50% helium
alloys	1	50% argon	1	50% argon
	2	Argon	1	Argon

Electrical characteristics—For most applications, Mig welding uses direct current, reverse polarity (dcrp). This gives best control of the arc, and results in a higher quality weld than with direct current straight polarity (dcsp). Straight polarity provides faster burn-off (melting) of the electrode, but results in greater weld porosity.

Alternating current is not satisfactory for Mig because of the difficulty in maintaining the arc. Any of the three classes of d-c power supplies may be used: CAC (constant arc current), CAV (constant arc voltage), or RAV (rising arc voltage).

The economics of whether or not to use Mig welding in your maintenance operation depend mainly on the types of welding done, present equipment in use and present welding costs. Table V lists some typical cost comparisons for manually welding steel, using inert gas. **End**

Table IV. Recommended operating data when Mig welding low-carbon, light gage steel butt welds.

Butt Welding Data With Low Carbon, Light Gage Steel

Metal Thickness (in.)	USS Gage	Electrode Size (in.)	Shielding Gas: Argon + Oxygen (cfh)	Shielding Gas: Argon CO_2 75% 25% (cfh)	CO_2	Welding Current (dcrp) (Amps)	Arc (Volts)	Wire Speed (ipm)	Weld Speed (ipm*)
0.030	22	0.035	20/40	20/40	30/40	55	14/15	130	28
0.036	20	0.035	20/40	20/40	30/40	60	15/16	165	30
0.048	18	0.035	20/40	20/40	30/40	70	15/16	195	30
0.060	16	0.035	20/40	20/40	30/40	80	15/16	220	30
0.075	14	0.035	20/40	20/40	30/40	135	15/16	318	32
0.105	12	0.035	20/40	20/40	30/40	165	15/16	400	40
0.134	10	0.035	20/40	20/40	30/40	190	15/16	485	44

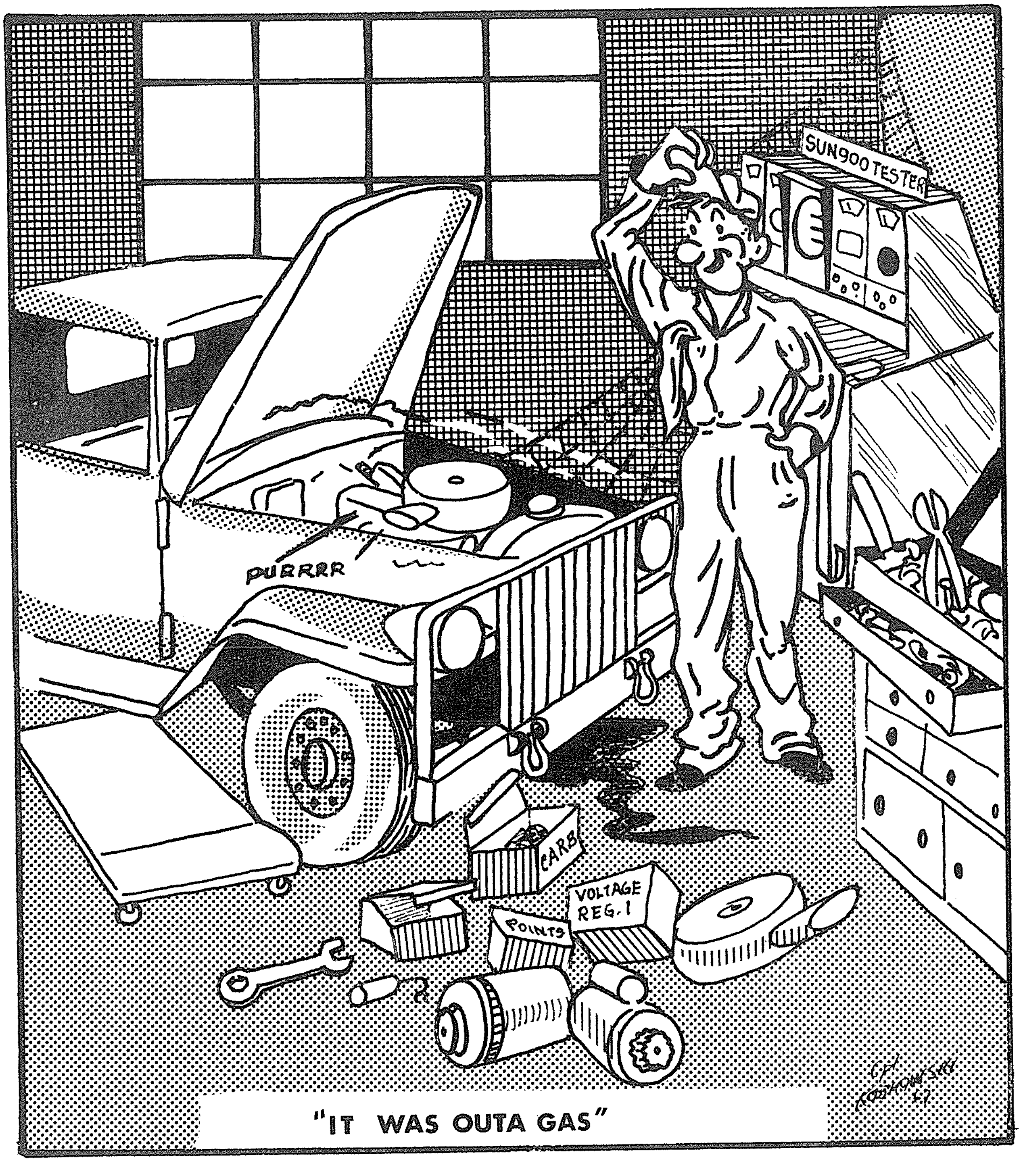
* Weld travel speeds shown are for welds of optimum quality and appearance. In exceptional cases where quality is not important, speeds of 200 ipm are practical.

Table V. Typical cost comparisons for manually Mig-welding steel, using various gases and polarities.

Cost Comparison of Manual Welds in Steel

	Argon—5% Oxygen					
	DCRP		*DCSP*		*CO_2, DCRP*	
Operating data:						
Travel speed, ipm	12	18	16	23	10	16
Welding current, amps	270	400	320	400	250	330*
Depsition rate, lb/hr	8.8	14.5	14.4	18.0	8.0	11.4
Arc time, hr/100 ft	1.67	1.10	1.25	0.87	2.00	1.25
Cost data:						
Welding wire ($0.35/lb)	5.43	5.92	6.30	5.49	5.60	5.00
Gas (argon, $0.10/cu ft, CO_2, $0.01/cu ft)	6.68	4.40	5.00	3.48	0.80	0.50
Labor and overhead ($5.00/hr, 50% operating factor)	16.70	11.00	12.50	8.69	20.00	12.50
Total Cost, $/100 ft of weld	28.81	21.32	23.80	17.66	26.40	18.00

* Limit of current for good quality welds, except on killed steels.



"IT WAS OUTA GAS"

IS YOUR SUN 900 MOTOR TESTER A COBWEB COLLECTOR

by

Staff Sergeant LM McClafferty

Are you having difficulties with engine tune up? Do your vehicles run but not quite as good as you think they should? In the days of the Model "T", a tune up was fairly simple. Just about all the adjustments required could be carried out by sight and sound. On the vehicles of today, sight and sound are not enough. What you need today is a good knowledge of tune up procedures and various instruments to ensure you are doing things correctly and not by the guess work method.

To take the guess work out of engine tune up, there are many machines available. If you look into the dark, dusty corners of your workshop or maintenance section, you will probably find one of these machines hiding. It will probably be a Sun 900 Scope Motor Tester. If you want to improve your tune up work, don't leave the machine to gather dust. Bring it out into the open and put it to work.

There are twenty-eight tests that can be carried out with this machine. Don't be afraid of the many gauges and maze of wires that confront you. An instruction manual is supplied with each tester. If you have a basic knowledge of engine operation and you can read, your tune up problems are over.

Before you dash madly off to your Sun Tester, let us explain briefly what the machine consists of and what you can do with it.

a. CYLINDER LEAKAGE TESTER. In order to do an effective tune up, it is essential that the combustion chamber be in good condition. The cylinder leakage tester is used by filling the cylinder with air and measuring the amount of air leaking out. If the amount of leakage is too great, the fault can be determined by listening to the engine to find where the air escapes. Air escaping from the oil filter cap indicates worn rings; air leaking from the tailpipe indicates a leaky exhaust valve; air leaking at the carburetor indicates a leaky intake valve; bubbles in the radiator show a cracked block or head; air leaking into the adjacent cylinder indicates a blown head gasket. This test will show up problems that a compression test might not reveal.

b. VOLTAGE TEST UNIT. This unit includes a voltmeter with ranges of 4, 10, 20, and 40, volts; a meter type ignition tester and an electronic distributor tester. The uses of this unit include the cranking voltage test, charging voltage test, battery cable tests, ignition primary resistance tests, battery leakage test. The electronic distributor tester is used to check and adjust initial ignition timing and to check the distributor advance mechanism.

c. TACH-DWELL TEST UNIT. This unit incorporates a tachometer with three speed ranges and a dwell meter which can be used to measure dwell angle and check the ignition points for resistance. With proper use, this unit will show the condition of the points without lifting the distributor cap. This can be a real timesaver especially on vehicles where the distributor is hard to get at.

d. CONDENSER COIL TEST UNIT. This unit is one which is used only when the engine is stopped. It incorporates a triple range ohmmeter, a condenser test unit and a coil test unit. The ohmmeter is used to measure resistance and can also be used to check the continuity of a circuit. It must never be connected to a hot circuit so make sure everything you are checking is switched off. The coil and condenser test units are used for testing the coil and condenser when thest parts are unhooked from the vehicle.

d. COMBUSTION-VACUUM TEST UNIT. This unit has a combustion efficiency meter and, the jack-of-all-trades in tune up work, the vacuum gauge. The combustion efficiency meter measures the unburned particles of fuel in the exhaust gas and tells us how the air fuel mixture is. This is especially useful in checking the carburetor and air cleaner. The uses of the vacuum gauge are so varied I will not attempt to cover them all but when used properly and in conjunction with the other instruments, it can lighten many a dark spot as far as tune up is concerned.

f. SUN SCOPE. Located in the centre of the Sun 900 panel is the heart of the whole shooting match, the ignition scope. This scope will show a graph - like picture of the ignition system while the engine is operating. Although considerable experience is necessary to correctly interpret the patterns, an experienced man can detect any problem in the ignition circuit faster than you can say Spark Plug. What makes the scope invaluable is its ability to show what is happening while the engine is in operation, which is of course when the trouble is happening.

I have explained the six basic components that make up the Sun 900 Motor Tester. To explain each test which can be carried out would be a repetition of what is already written in the instruction manual. The manual lists the twenty-eight tests in a logical sequence and the best method of learning them is by actually using the machine.

Before you start brushing the cobwebs off your tester, remember:

a. Do not try to operate the tester without studying the manual.

b. Have the manufacturer's specifications for the vehicle you are testing.

c. Treat the machine with tender, loving care.

It cost a lot of dollars.

If these rules are followed, you will probably find that the Sun 900 Scope Motor Tester is one of the most valuable tools a tune man can have.

I hope that this very brief explanation of the Sun Motor Tester will convince you how valuable it can be in the field of trouble shooting. Many frustrating hours can be saved if you take a little time to learn how to use this machine and then use it-why not give it a whirl?

TIRE STUDS HAVE THEIR DRAWBACKS

(The Kingston Whig Standard Wed 31 Jan 68)

WASHINGTON (Medill News Service) —At zero the studded tire is only slightly more effective on ice than the regular highway tire: on dry roads it may cause severe damage to the pavement.

That's what two recent studies sponsored by the U.S. federal government say.

The studded tire's maximum resistance to sliding on ice-covered roads is achieved at 32 degrees, one report said, but traction is gradually lost as the temperature decreases and the ice hardens.

Another research team from the same firm, the Cornell Aeronautical Laboratory of Buffalo, New York, found that "pavement wear (by studded tires) was severe enough to warrant a comprehensive investigation of the conditions which control its severity."

In analysing the tire's effectiveness, the Cornell team of K. D. Bird and F. R. Haselton found that the pressure of the stud on the pavement and the stud shape determined the tire's traction. The researchers also found that a car's cornering ability on solid ice is improved if both front and rear wheels are equipped with studded tires.

It is these same factors that determine the damage the tire does to the highway, according to the other Cornell team of Paul Rosenthal and Phillip J. Joseph.

"Most of the research on studded tires is being done in Europe," a spokesman for the highway research board said. The tires were introduced there first and the percentage of drivers using them is much higher than in the United States.

In Norway, where more than half of the cars are equipped with studded tires on all four wheels, the government reports that damage to roads is "very serious."

West Germany is considering a special tax on studded tires to help pay for the damage they do to roads.

Only 10 per cent of U.S. cars are equipped with studded tires and very few have them on all four wheels.

But the percentage is increasing. Twenty-five percent of all winter tires sold last year were equipped with steel studs.

"We've sort of accepted the fact that the studded tire will not be outlawed," the HRB spokesman said. "The object now is to develop a pavement which will resist wear better.

As the road ages, studded tires have an increasingly adverse effect.

Studded snow tires have been controversial since their introduction into the United States, according to the HRB spokesman.

Last August the New Jersey department of highways released a study which said, in effect, that the studded tires were not worth the price. The study said the tires lost their effectiveness after 5,000 miles.

One subject which needs to be researched, according to another member of the HRB, is the danger of studs flying out from the tire and striking pedestrians.

CORPS MUSEUM

SOL DES CIMETIERES CANADIENS EN FRANCE

OFFERT AU

GENIE ELECTRIQUE ET MECANIQUE

PAR

LE REGIMENT DE LA CHAUDIERE

JUIN 61

The title above is taken from a small chest held in the RCEME Museum. During her trip to Quebec City in September 1960, Comtesse Hettier de Boislambert, "The Chaudiere Regiment Godmother", gave His Excellency the Governor General of Canada, a small chest containing soil collected from French cemeteries where Canadian Servicemen have been laid to rest.

At that same ceremony, when Major General Vanier awarded the custody of the chest to Lieutenant-Colonel Leandre Lacroix, Commandant of the Chaudiere Regiment, the Commandant pledged to share the soil with all other Units and Services which had fought in France.

The soil in the RCEME Museum is held in honour of those RCEME personnel who fought and remained in France during the last war.

CANADIAN ARMED FORCES RESERVE COMPONENTS.

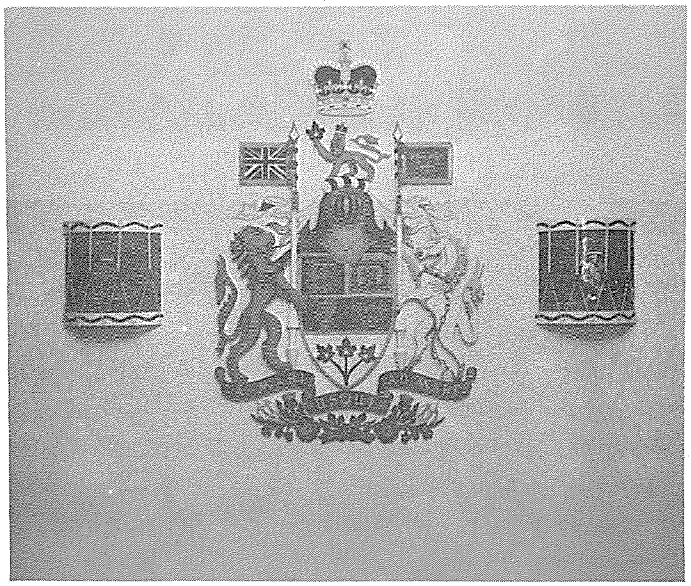
The results of the RCEME (M) annual competitions 1966/67 are as follows:

TROPHIES	WINNERS
a. Rifle Competition	20 Tech Sqn
b. Tradesmen	28 Tech Sqn
c. Jr NCO	28 Tech Sqn
d. W.L. Thompson	28 Tech Sqn

The trophies are awarded to RCEME (M) units for the following reasons:

a. Rifle Competition plaque to the unit achieving the highest average score on all rifle practices during the annual range classification;
b. The Tradesmen trophy to the unit which qualified the greatest percentage of tradesmen to group 1 or group 2 level.
c. The Jr NCO trophy to the unit qualifying the highest percentage of eligible men to Jr NCO; and,
d. The William Lennox Thompson trophy to the unit achieving the highest efficiency rating based upon effective strength, percentage of qualified tradesmen, attendance at summer camp, and entries in other RCEME Corps Association competitions.

28 TECHNICAL SQUADRON RCEME (M)



A unique centenial project, seven foot tall and four foot wide, located on the south wall of the Sergeants' Mess of the Peterborough Armoury.

Maj-General George Kitching unveiled the Coat of Arms which is made of wood, cloth and tapestry. The intricate parts are shaped and painted with great precision. The Maj-General said it was a superb piece of work.

The Mayor AA Wiggins representing CO 28 Technical Squadron unveiled the drums bearing the RCEME Crest. Lt. Col OFC Cook Commanding Officer 50 Fd Artillery Regt RCA unveiled the drums bearing the Artillery crest.

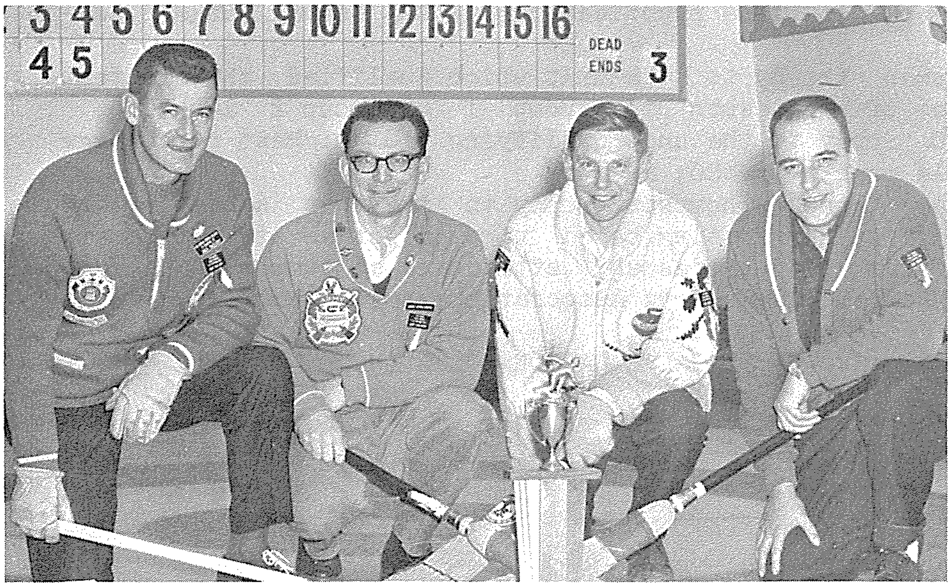
SPORTS PAGE

FIFTH ANNUAL ONTARIO RCEME BONSPIEL

CFB Petawawa hosted the fifth annual Ontario RCEME Bonspiel starting on Friday 19 Jan 68. SSgt Ken White as Master of Ceremonies arranged a piper to open the spiel and the Base Commander threw the first rock.

Visitors were all appreciative of the reception they received and everyone benefitted from the excellent organization provided by the draw master Bob Chandler.

Major B.M. Deibert gave an informal talk on the history of the bonspiel and mentioned that it may be the last time it was played under its present name. It was, therefore, fitting that the skip of the winning rink, Jack McIlroy, be one of the founding members of the spiel.



WINNERS OF 14 COY RCEME FIRST event trophy

Jack McElroy
Jack Chalmers
Dave Geary
Bob Owen

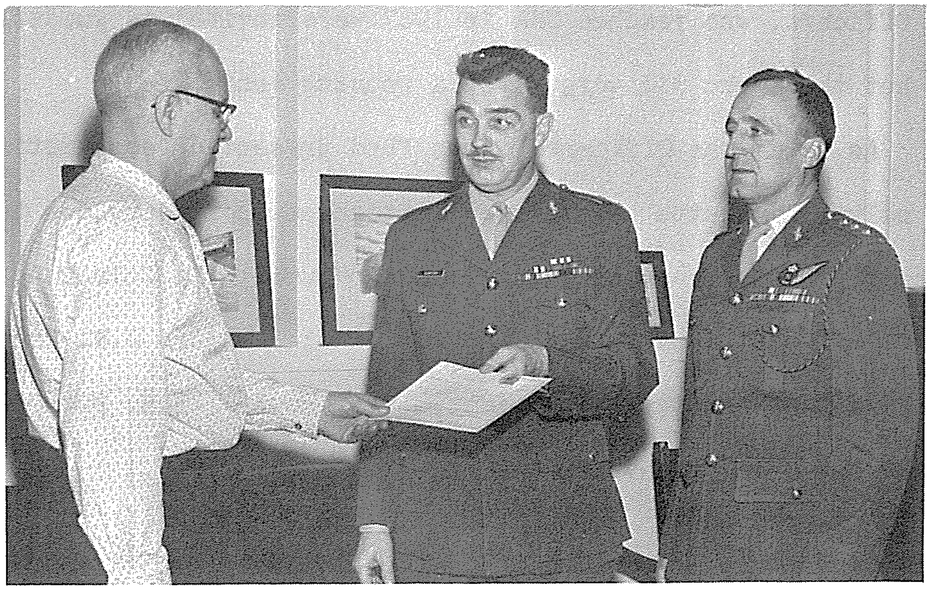
Major D. Geary presenting RCEME SCHOOL Trophy to winners of 2nd event to Alex Jackson, Hank Noel, Ron Walker, Butch Milne.

PERSONALITIES

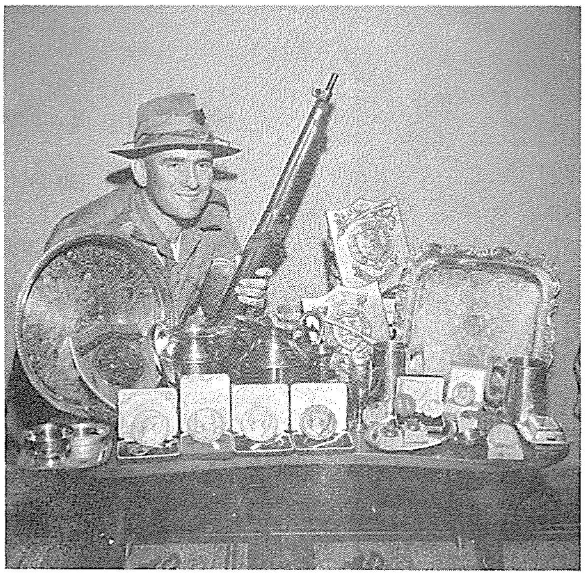
Mr. John H. Rollwagen of base Maintenance Section (Land). CFB Winnipeg, Manitoba receiving his Twenty - five Year Civil Service Certificate and pin.

The certificates and pins were presented by the commanding officer Major C.R. Burton CD. The officer in charge of the workshop, Capt J.A. Stott CD, witnesses the presentation to ensure all is navigated according to plan.

Mr. Edwin F. Walberg of Base Maintenance Section (Land) CFB Winnipeg, Manitoba receiving his Twenty-five Year Civil Service Certificate and pin.



RCEME WARRANT OFFICER TO REPRESENT CANADA



Readers may be interested in knowing that WO 2 Frank Jeremy, RCEME School, is one of two regular force members selected for the Dominion of Canada Rifle Team to tour Australia and New Zealand. WO 2 Jeremy leaves for Vancouver on 16 Feb and returns on 17 Mar. We wish him and his team every success in the antipodes.

RCEME OFFICERS RETIREMENT DINNER

The Annual RCEME Officers Retirement Dinner was held at the Corps Mess, in conjunction with the Land Materiel Maintenance Study Period, on Friday 26 Jan 68. All RCEME Officers, who reached CRA in 1967 were invited as guests. Not all were able to attend, but those who did were given a rousing send off.

As usual the Officers Corps Fund presented each retiring officer with an engraved silver cigarette box, in recognition of their services to the Corps.

The officers who retired in 1967 were; Lt Cols D.A. Campbell, H.L. Cohen, K.F. Collins, F.J. Sergi and C.G. Lawrence; Majors J.N. Finder-Moss and W. Rhodes; Capts F.R. Carruthers, F.A. Ouimet, J.L. Moyse, R.H. Purton, A.G. Rose, R.H. Thorn, L.M. Harvey and Lt F.N. Brodie.

whos where

LOCATION OF RCEME OFFICERS

Locations are from available records held at THE RCEME SCHOOL as of 31 Jan 68. Communicate any corrections direct to the Commandant THE RCEME SCHOOL attention Pers Officer.

BRIGADIER

KH	McKibbin	CFHQ, DGOS
A	Mendelsohn	HQ Matcom

COLONEL

AHR	Lewis	CFHQ, D Base Dev
AL	Maclean	RCEME School
WJ	Owens	CFHQ, DGOS, DVFE
AM	Reid	HQ Mobcom
KR	Ward	HQ Matcom

LIEUTENANT COLONEL

J	Adams	CFHQ, LETE
CH	Betts	CFHQ, DGOS, DVFE
JC	Boughton	EBS Bn Gagetown
GW	Bruce	202 Wksp Dep Montreal
DG	Carlyle	HQ Matcom
BB	Cox	CFB Calgary
EB	Creber	RCEME School
RF	Fendick	HQ Mobcom
SA	Girdler	HQ Matcom
WH	Glover	CFB Gagetown
RHC	Hodgson	27 COD London
EC	Ilott	CFHQ, DGOS, DARME
FG	Johnson	27 COD London
EG	Jones	CFHQ, DGM DEM
KR	Joslin	CDLS London, England
RW	Libbey	HQ Trg Comd
ALD	MacDonnell	CDLS Washington
JH	MacLean	CFHQ, DGOS, DVFE
AGM	Maitland	CASC Kingston
CG	Provan	HQ Matcom
CG	Racicot	CFB Montreal
RC	Rivers	HQ Matcom
ANP	Roberts	HQ Matcom
M	Ruscher	CFHQ, DGM, DEM
DJ	Tidy	CFHQ DGSM DPL
JM	Treleaven	CFHQ, CG D Man Eng
B	Yarymowich	CFHQ, DGOS, DARME

MAJOR

AM	Adams	CFSC Toronto
KI	Anderson	CFHQ, DLFORT
P	Bateson	RCEME School
JMF	Bourassa	CFSC Toronto
JE	Brown	202 Wksp Dep Montreal
GR	Burton	CFB Winnipeg
LN	Bydal	HQ Matcom
AB	Cantlon	CFB Montreal
FW	Chapman	HQ Mobcom
HW	Chapman	HQ Matcom
G	Charles	CFHQ, LETE
BC	Clerke	HQ Matcom
RDL	Connell	RCEME School
JH	Cooper	CFHQ, DGM, DMP
JJE	Cuddihey	CFHQ, DGOS, DARME
LA	Daviss	CFHQ, DGOS, DARME
BM	Deibert	CFB Borden
JJR	Doucet	4 Fd Wksp NWE
DH	Fraser	202 Wksp Dep Montreal
JJ	Garnet	CFB Gagetown
DV	Geary	2 Fd Wksp Petawawa
RE	Goulding	CDLS, London, England
NA	Graham	CFB Kingston
PM	Graye	CASC Kingston
JR	Griffin	CDLS, London, England
WJN	Haggins	CFHQ, DCAS, DASE
DV	Hampson	CAFTT Ghana
HV	Hann	27 COD London
PEV	Hansen	CDLS Washington
CB	Hellyer	27 COD London
FA	Hlohovsky	CDLS, London, England
HW	House	HQ Matcom
CA	Hurst	CFB Edmonton
FG	Hutson	HQ 2 CIBG Petawawa
ID	Isbester	Univ of Western Ontario London
AJ	Jeffrey	CFB Kingston
MC	Johnston	CFHQ, DG Prog DPPC
KT	Kennah	EBS Bn Gagetown
NE	Laviolette	CFB Valcartier
JW	Lelacheur	CAFTT Ghana
AM	MacDonald	CAFATTTanzania
AJ	MacGillivray	RCEME School
RL	MacIntosh	CDLS Washington, (Rock Island)
RH	MacLeod	CFB Halifax
MG	Masuda	CFB Petawawa
CA	Millar	1 Fd Wksp Calgary
RW	Miller	CASC Kingston
CR	Morgan	CDLS Washington (Det)
DR	Mowbray	CFHQ, DTPP

MAJOR

JD	McDougall	CFSC Toronto
MD	McKinlay	HQ Matcom
DA	Nicholson	CFB Calgary
WH	Norton	CFHQ DPCSE
PH	North	CFHQ, DGOS, DVFE
DB	Perrin	HQ Mobcom
R	Peters	RCEME School
HCR	Pfeiffer	CFHQ, DGOS, DVFE
PP	Pospisil	CASC Kingston
JA	Richards	202 Wksp Dep Montreal
HQ	Rosson	HQ Matcom
LA	Sainsbury	CFB Halifax
CD	Savage	HQ Matcom
RB	Screaton	CFB Soest NWE
RN	Shaw	CFB Toronto
JO	Sheehan	CFB Rivers
WD	Sneddon	CDLS London England
WG	Svab	CFSC Toronto
AR	Thomsen	RCEME School
PA	Tuck	CFHQ, DLFORT
RW	Vollett	CFB Chilliwack
EA	Williams	Seconded to DRB Ottawa
WR	Willing	CFHQ, VCDS, DAOR
DE	Wilson	CASC Kingston
GA	Wright	CFHQ, DGOS, DVFE

CAPTAIN

JH	Armstrong	Ld SH (RC) NWE
LW	Armstrong	HQ Ontaric Region Oakville
WD	Armstrong	CDLS London, England
DS	Axford	CFHQ, CG DMRE
KD	Baird	2 RCHA Gagetown
JT	Bart	FGH Calgary
RG	Bell	2 QOR of C, Calgary
RE	Betzner	CFHQ, CTS, DACS
JPA	Boucher	1 R 22e R NWE
JBR	Bouliane	CADEE Valcartier
CN	Brent	HQ Matcom
JE	Brewster	CFB Chilliwack
RP	Britt	2 Fd Wksp Petawawa
PL	Burcombe	202 Wksp Dep Montreal
HD	Byer	CFB Soest NWE
JL	Calvert	CFB Edmonton
JNR	Campbell	CFB Halifax
CA	Churchill	HQ Matcom
DL	Clarke	CFB Borden
BL	Code	HQ 4 CIBG NWE
RF	Conway	HQ Matcom
JT	Cooper	EBS Bn Gagetown
JGD	Crookston	2 PPCLI NWE
DH	Cumming	RCEME School
GW	Davies	RMC Kingston
JS	Davies	CFB Kingston
EA	Edmond	27 COD, London
RI	Ferguson	2 RCHA NWE
JNR	Fischer	2 RCR NWE
RJ	Francis	1 Fd Wksp Calgary

CAPTAIN

RR	Fraser	RCD Gagetown
JJJ	Fyfe	4 Fd Wksp NWE
AM	Gilbert	HQ Matcom
JJC	Girard	2 Fd Wksp Petawawa
PAR	Glynn	CFB Soest NWE
GE	Grainger	CFHQ, DCSE
WJA	Groom	HQ Matcom
GT	Hammond	CFHQ, DMPC
JI	Hanson	4 Fd Wksp NWE
RT	Hare	CFB Esquimault
TW	Healy	CFB Toronto
HJ	Hellard	RCEME School
KW	Henderson	CFHQ, DPCSE
JJ	Kane	CFB Moose Jaw
DC	Kaufman	27 COD, London
JR	Kaye	CFB Calgary (Wainwright)
HG	Kayne	HQ Matcom
GW	Keayn	CFB Soest NWE
JEY	Kingsbury	1 Fd Wksp Calgary
WW	Laird	RCEME School
JR	Lamb	8 CH Petawawa
FH	Leach	CFB Rivers
LE	Leflar	RCEME School
FG	Legg	CFB Calgary
JW	Lowthian	RMC Kingston
WF	Lucano	HQ Trg Comd
RMG	MacKenzie	CFB Chilliwack
EB	MacLellan	HQ Marcom
GE	Maguire	RCEME School
DM	Maher	CFB Shilo
RB	Manning	1 Tpt Hel Pl St Hubert
JJP	Marchildon	3 R 22e R Valcartier
JHPL	Martel	2 R 22e R Valcartier
RJ	Millen	CFB Edmonton
HC	Morgan	CFB Petawawa
WR	McCaughan	CFB Soest NWE
GD	McCulloch	4 Fd Wksp NWE
AL	McEachern	EBS Bn Gagetown
LF	McLeod	CFB Gagetown
A	Nellyston	CDLS London, England
JF	O'Connor	202 Wksp Dep
JLPJ	Paquette	EBS Bn Gagetown
TR	Patterson	202 Wksp Dep Montreal
CA	Penny	4 FD Wksp NWE
NE	Pothier	United Nations Forces Cyprus
PG	Pothier	202 Wksp Dep Montreal
CF	Potter	Dalhousie University
HG	Ray	3 RCHA Winnipeg
GA	Riley	202 Wksp Dep Montreal
WD	Roche	RCEME School
EA	Rochefort	EBS Bn Gagetown
JGHL	Roy	202 Wksp Dep Montreal
FG	Scagnetti	Ld SH (RC) NWE
RH	Sequin	CFB Valcartier
BH	Simms	4 Tpt Coy NWE

CAPTAIN

GE	Smith	HQ Matcom
JH	Spackman	RCEME School
WRL	Springford	RCEME School
RJP	St Aubin	1 Tpt Hel Pl St Hubert
JA	Stott	CFB Winnipeg
TW	Strang	1 PPCLI Edmonton
GW	Swallow	HQ Matcom
JT	Thompson	HQ Mobcom
MKM	Trevors	CAFATT Tanzania
GR	Walker	HQ 1 CIBG Calgary
RL	Walker	CFB Rockcliffe

LIEUTENANT

CG	Ashdown	HQ ADC North Bay
RJ	Atkins	Hel Op Trg Sqn Petawawa
FH	Atwood	CFB Petawawa
NE	Austin	1 Fd Wksp Calgary
WG	Barrey	CFHQ LETE
JAR	Benoit	202 Wksp Dep Montreal
RA	Bergeron	HQ Matcom
DL	Black	2 Tpt Coy Petawawa
JABR	Bouchard	CFB Montreal
JPA	Branchaud	1 CSR Kingston
JP	Brown	RCEME School
JJR	Carrier	202 Wksp Depot Montreal
PGG	Collinge	CADEE Valcartier
JR	Convoy	FGH Calgary
JR	Coulombe	1 Fd Wksp Calgary
RJ	Curren	EBS Bn Gagetown
JP	Deschenes	CFB Valcartier
JPJP	Dagenais	CADEE Valcartier
DD	Dorman	RCEME School
JCG	Dupont	202 Wksp Dep Montreal
JJ	Durepos	CFB Shilo
HT	Edworthy	RCEME School
TJ	Enwright	2 Fd Wksp Petawawa
DH	Feller	CFB Winnipeg
JWA	Fryer	4 Fd Wksp NWE
AB	Fuller	RCEME School
AR	Gillis	1 Fd Wksp Calgary
JHRY	Girard	RCEME School
W	Glover	CFB Toronto
GWE	Godson	EBS Bn Gagetown
RA	Green	EBS Bn Gagetown
DR	Hamilton	FGH Calgary
DR	Hartwick	Ld SH (RC) NWE
LCA	Hellemans	1 RCR London
WH	Hightower	Ld SH (RC) NWE
JS	Holt	RCEME School
VE	Hoskin	CFB Borden
E	Housken	CFB Gagetown
R	Jobin	CFB Valcartier
EF	Joyner	CFB Kingston (Picton)
BE	Kelly	CFB Winnipeg
RP	Kudar	RCEME School
JM	Lafleur	RCEME School

LIEUTENANT

RL	Langdon	4 Tpt Coy Calgary
JPR	Leblanc	CFB Montreal
WG	Leslie	CFB Calgary
KO	Loven	HQ Matcom
CW	MacDonald	HQ Matcom
AI	MacKenzie	CFB Rivers
WO	Manktelow	HQ ATC Trenton
PC	Marriner	RMC Kingston
WB	Mason	CFHQ, LETE
GR	Melvin	CFB Uplands
WA	Mersereau	RCEME School
JD	Murphy	CFHQ, CTS, DESE
CE	McClafferty	4 Fd Wksp RCEME NWE
JAN	Nault	202 Wksp Dep Montreal
JCG	Nappert	4 Fd Wksp NWE
JC	O'Rourke	2 Cdn Gds Petawawa
TJ	Panke	2 Fd Wksp Petawawa
FG	Parsons	CFHQ, DEVIL Programme
JGMY	Pedneault	CFB Gagetown
V	Pergat	4 Fd Wksp NWE
JAM	Perreault	1 QOR of C Esquimault
KML	Pirt	CFB Rivers
JMB	Podesto	202 Wksp Dep Montreal
RV	Potter	CADEE Valcartier
HT	Simpson	4 Fd Wksp NWE
DB	Sinden	2 Fd Wksp Petawawa
GAJ	Smith	RMC Kingston
NC	Smith	CFHQ, LETE
JD	Snell	CFB Kingston
CN	Sochasky	RCEME School
DW	Stevens	HQ Matcom
SD	Suley	1 Tpt Hel Pl Det Namao
IJ	Taylor	CFB Chilliwack
R	Thomas	202 Wksp Dep Montreal
JEGA	Touchet	202 Wksp Dep Montreal
BG	Walker	HQ Matcom
J	Walker	202 Wksp Dep Montreal
RT	Weston	HQ Matcom
TG	Whitehead	HQ Matcom
WJ	Wood	HQ Matcom
JA	Woodrow	27 COD London

REME EXCHANGE OFFICERS

Major DH Hill REME exchange officer at The RCEME(S) has been replaced by Major MS Caygill. Major Hill is now at The War Office and his home address is 607 Howard House, Dauphin Square London SW 1